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DD/S&T# 5870-66

ORD-4912-66

15 NOV 1966

MEMORANDUM FOR: Director of Research and Development

SUBJECT: CHIGOE ASW Tests at Norfolk, USN Briefing

1. On 7 and 8 November the CHIGOE Active Magnetics and SD5 Infrared Systems were tested against the SS272, "Redfin," a conventional fleet submarine. The purpose of the test was to evaluate their potential for ASW, with emphasis on the Active Magnetics approach which had, heretofore, only been used over land. The preliminary results are most encouraging, in that real-time detections were made with the target submerged, under realistic operating conditions. Final test results will require two to three weeks for data reduction and IR correlation. USN was briefed on the preliminary results.

2. The CHIGOE systems were installed in the ORD P2 test aircraft and brought to Norfolk NAS on Sunday, Nov 6. On the 7th, an early morning coordination session was conducted on board the Redfin, which then departed for its operating area off the coast. At approximately 1130 we overflew the Redfin on the surface, near Chesapeake Light, at the entrance to the Bay ship channel. Enough runs were made at different altitudes and crossing angles to record characteristic Active Magnetic responses for later analysis, and to confirm that the real-time readout was reasonably effective. Because this is the largest (328 ft.) target we have attempted so far, there was and still is some doubt that the spatial filtering we employed was optimal.

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3. At about 0100 on the 8th, we located the Redfin on the surface about 200 miles east of Chesapeake Light, in 1500 fathoms of water. Weather was clear, sea normal with large swells, water temperature 72°F. Runs were made at altitudes from 300 to 3000 ft. above the surface, while the Redfin went through a series of planned maneuvers at periscope depth, 100, 200, and 300 ft. Visual contact was kept through the use of air-dropped and underwater-launched floating flares, and through the employment of running lights and the Grimes lamp while submerged. Visual contact was lost at the 300 ft. depth, but a flare was dropped on the basis of the Active Magnetics alone, which proved to have been accurate when the target surfaced.

4. The detection correlation appeared generally good at slant ranges of well over 1000 ft. (target at 300 ft., altitude 700 to 750 ft.). Data reduction alone will tell us how good it really was, as there were known spurious signals in the record from a newly installed digital clock and from aircraft UHF transmissions.

5. On 10 November Mr. [] and I briefed Admirals Gaylor, Michaelis, and Dobie and their staffs on the preliminary test results, and on the system operating principles. This briefing was very well received, Admiral Dobie in particular being most anxious that we should continue to feed information as the ASW work develops. The consensus of the ASW people there present was that present MAD gear is limited to 600-1000 ft. slant ranges, and that it has no real search potential for the future. The latest MAD system (ASW-81) will be a 1000 ft. system at best, in operations.

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6. We made it clear that there was real danger in extrapolating from our present crude prototype to a complete new ASW technique better than MAD, and that we still have a tremendous amount of R&D to accomplish. This was accepted, but full USN cooperation in future tests was guaranteed on the basis of apparent good results in this first trial and on the previously demonstrated success in our over-land tests.

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